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NEW SPECIES OF *BEREA* (COPEPODA, CHONDRACANTHIDAE) PARASITIC ON A FLOUNDER FROM KUWAIT

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ABSTRACT: *Berea clava,* new species, is described based on the specimens recovered from the gill filaments of a flounder, *Pseudorhombus arsius* (H.-B), collected in Kuwait Bay of Arabian (Persian) Gulf. This is the second species of *Berea.*

KEYWORDS: Parasitic copepods, *Berea,* Kuwait, Chondracanthidae.

INTRODUCTION

In our recent report on the parasitic copepods of marine fishes from Kuwait (Ho & Sey, 1996), a new form of Chondracanthidae parasitic on the gills of *Pseudorhombus arsius* (H.-B) was mentioned; however, it was not treated in that paper due to the scarcity of the specimens (one complete and three damaged female specimens; only one of them carrying a dwarf male). Since subsequent efforts in examination of the same species of host fish had yielded more specimens, the new parasites were carefully studied and described in this report.

MATERIALS AND METHODS

The host fishes, caught in the Kuwait Bay of the Arabian Gulf and sold in the local fish market, were purchased and examined in the laboratory of the Department of Zoology at Kuwait University. The parasitic copepods attached to the gill filaments of the flounder *Pseudorhombus arsius* (H.-B.) were carefully scraped, examined under the dissection microscope, and the copepod parasites were removed and preserved in 70% alcohol. For the subsequent microscopic studies, the preserved copepods were soaked in lactic acid for six hours before dissection. In making identification, the appendages of the parasite were dissected free and examined using the technique devised by Humes & Gooding (1964).

BEREA CLAVA N. SP.
(Figs.1-3)

Material examined:

Thirteen females (4 broken, 5 lost attached male) on gill filaments of *Pseudorhombus arsius* (H.-B.) collected from the Kuwait Bay of Arabian (Persian) Gulf: 4 recovered on 25 June, 1993; 2 on 10 October, 1996; 4 on 16 October, 1996; and 3 on 30 November, 1996. Holotype (USNM-285488) and 5 paratypes (USNM-285489) deposited in the US National Museum of Natural History, Smithsonian Institution, Washington, DC, and 3 paratypes deposited in the collection of the Department of Zoology, Kuwait University.

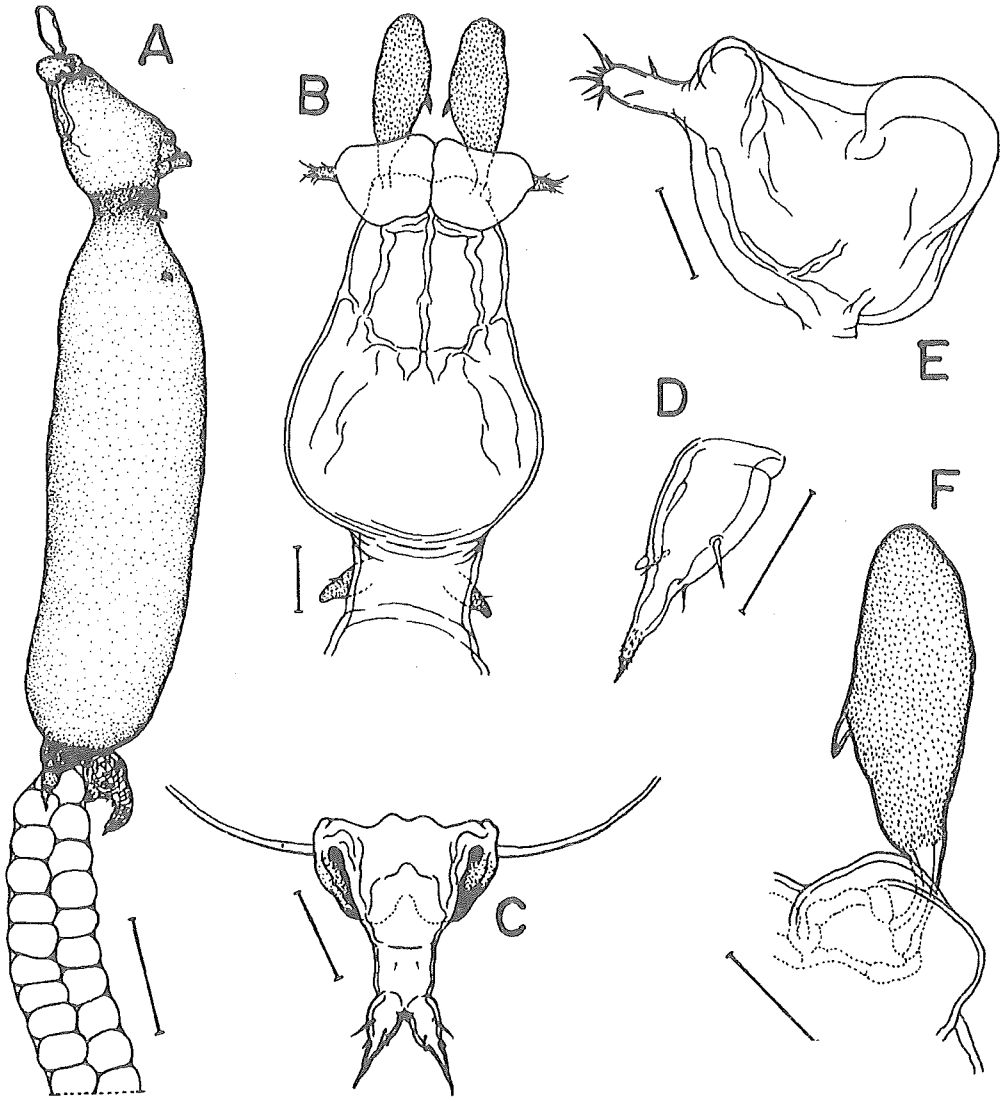

Fig. 1. *Berea clava* n. sp., female. A. Habitus, lateral (with right egg sac removed); B. Head and neck, dorsal; C. Genito-abdomen, dorsal; D. Caudal ramus, ventral; E. Antennule, ventral; F. Antenna, ventral. Scale: A, 0.5mm; B,C,F, 0.1mm; D,E, 0.05mm.

Female:

Body (Fig.1A) elongate, cylindrical; total length (not including antennae and caudal rami) 2.39 - 3.18mm. Head (Fig.1B) distinctly longer than wide, measuring 0.52x0.38mm, and composed of cephalosome only. Neck short, made up of first pediger. Second pediger together with remaining thoracic somites fused into elongated trunk, without process. Genito-abdomen (Fig.1C) slightly longer than wide, measuring 0.21x0.19mm (not including caudal rami); abdomen much narrower than genital-double somite and carrying a pair of small setules on dorsal surface. Caudal ramus (Fig.1D)

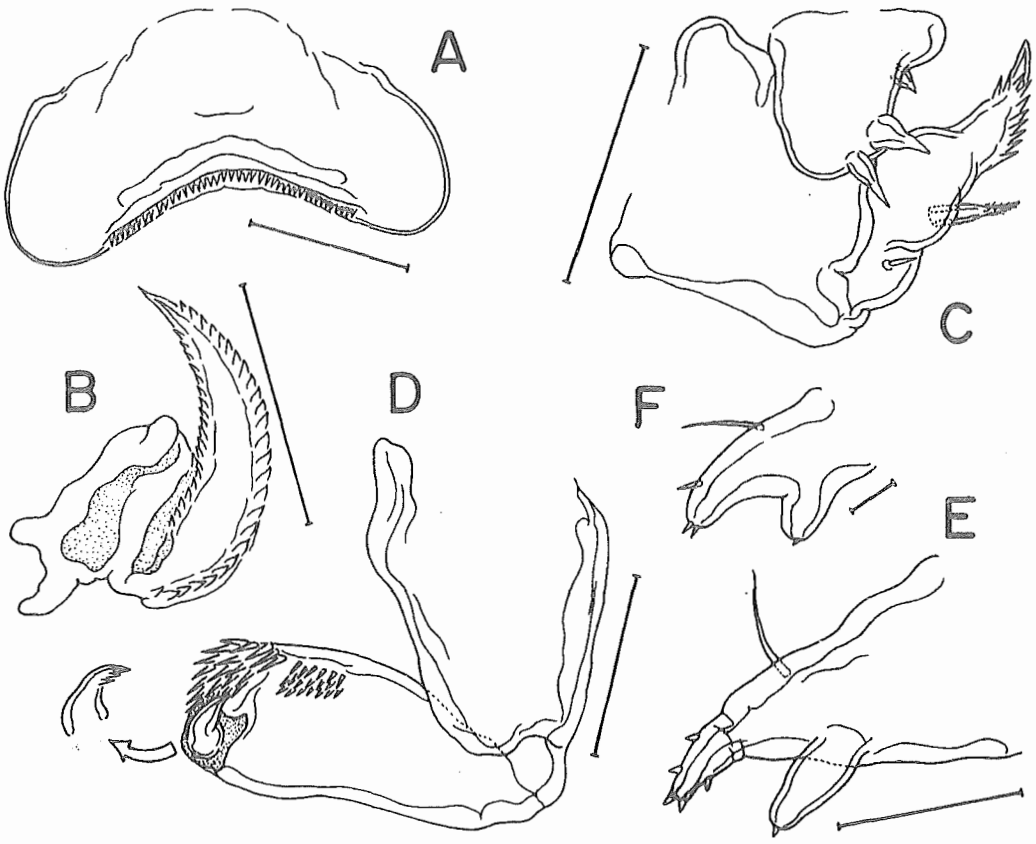

Fig.2. *Berea clava* n. sp., female. A. Labrum, ventral; B. Mandible, dorsal; C. Maxillule and maxilla,ventral; D. Maxilliped, dorsal; E. Leg 1, posterior; F. Leg 2, posterior. Scale: A,B,C,D,E, 0.05 mm; F, 0.01mm.

armed with 3 setae and 1 small, acuminate, inner knob in basal region, and pointed, spinulated tip. Egg sacs longer than body, with only 4 rows of eggs.

Antennule (Fig.1E) with greatly enlarged, basal portion and small, short, cylindrical, distal portion; armature on latter only, being 1,1,8. Antenna (Fig.1F) clavate, with slender short shaft tipped with enlarged, blunt blade carrying a sharp, posteriorly directed, medial tooth; thick sclerite on blade riddled with lacunae (appearing as covered with spinules). Cephalosome slightly swollen and covering basal part of antenna (Fig.1F).

Labrum (Fig.2A) with a row of fine teeth on central part of posterior margin. Mandible (Fig.2B) 2-segmented, terminal segment falcate, with a row of 26 teeth along convex (posterior) margin and another row of 24 teeth on concave (anterior) margin; both rows not reaching tip. Paragnath a simple spinulose lobe. Maxillule (Fig.2C) an oval lobe, bearing 2 elements at tip and another small pointed element on inner surface of base. Maxilla (Fig.2C) 2-segmented; basal segment robust and unarmed, terminal segment a blunt process bearing 1 naked, small and 1 barbed, large seta on proximal surface, and a row of 14 pointed spines extending distally from median (posterior) surface

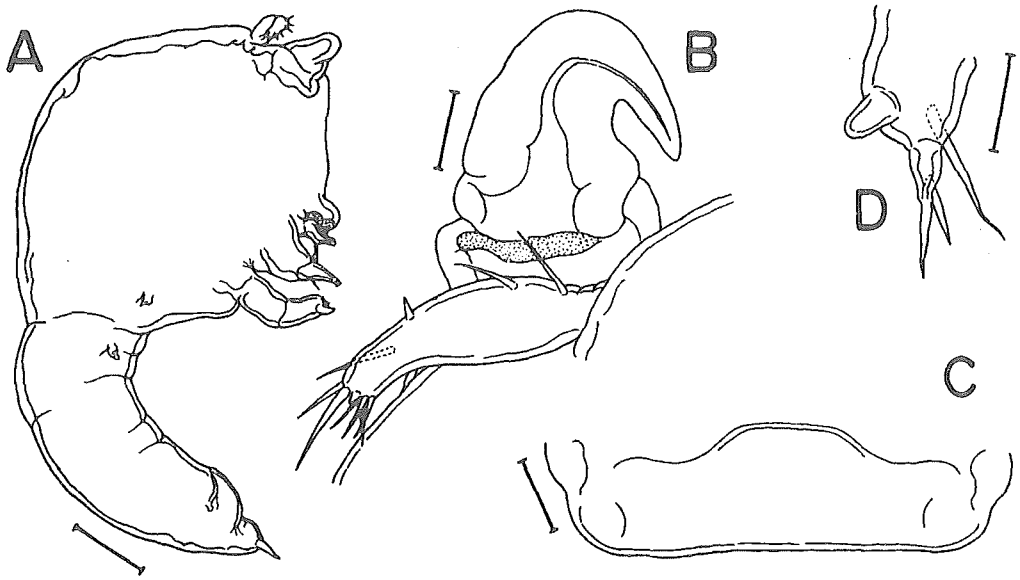

Fig.3. *Berea clava* n. sp., male. A.Habitus, lateral; B. Antennule and antenna, anterior; C. Labrum, ventral; D. Leg. 1, posterior. Scale: A, 0.05mm; B,C,D, 0.01 mm.

and then outward (anterior) subterminally. Maxilliped (Fig.2D) 3-segmented; proximal segment unarmed, middle segment bearing 2 patches of denticles on inner and distal surfaces, and terminal segment a small claw bearing 2 hooklets.

Leg 1 (Fig.2E) modified and bilobate; protopod carrying a long, outer seta; exopod armed with 5 tiny, spiniform elements, and smaller endopod tipped with single blunt spinule. Leg 2 (Fig.2F) much smaller than leg 1; armature generally as in leg 1 except exopod bearing 3 (instead of 5) elements.

Male:

Dwarf and attached to genital area of female (Fig.1A). Body (Fig.3A) 0.46x0.15mm, with greatly enlarged cephalothorax (containing first pediger) and strongly arched metasome; widest portion located in cephalosome at level of oral region. Segmentation in metasome indistinct. Genital-double somite with typical ventral ridge and caudal ramus generally as in female.

Antennule (Fig.3B) elongate, armed with rather long setae, armature being 1-1-2-8. Antenna (Fig.3B) 2-segmented, of usual chondracanthid form tipped with a recurved hook.

Labarum (Fig.3C) with smooth posterior margin. Mandible and maxilla showing sexual dimorphism in having smaller number of teeth on second segment. Maxillule and maxilliped generally as in female.

Leg 1 (Fig.3D) biramous; protopod armed with a long outer seta; endopod a small protrusion and exopod armed with 2 slender spines. Leg 2 as in leg 1, only smaller.

Etymology:

The specific name *clava* is a Latin meaning "club". It refers to the rather unique club-shaped attachment organ - the antennae.

DISCUSSION

Berea is a monotypic genus established by Yamaguti (1963) to accommodate *Triphyllacanthus ancoralis* Bere, 1936. And, after studying the type specimens of Chondracanthidae deposited in the National Museum of Natural History in Washington, DC, Ho (1970) proposed to relegate *Acanthochondria tenuis* Pearse, 1952 and *Pseudochondracanthus nellcauseyae* Causey, 1955 to the synonyms of *Berea ancoralis*. Since then, no further report on *B. ancoralis* has been made; therefore, it remains as a copepod parasite known only form the gill filaments of bat-fishes (*Ogocephaus* spp.) occurring in the Gulf of Mexico (Ho, 1970).

Since *Berea* is the only chondracanthid genus known to attach to their hosts with a pair of clavate antennae and the antenna of the present new species appears different from that of *B. ancoralis*, in our preliminary examination without dissection (due to the scarcity of specimens), we thought the parasites obtained from the flounder of Kuwait Bay represented a new genus of the Chondracanthidae (Ho & Sey, 1996). However, after studying closely the structural details of the dissected appendages of both sexes, it was concluded that the specimens from Kuwait still fall within the generic diagnosis redefined by Ho (1970).

Nevertheless, the females of *B. clava* is readily distinguishable from those of the only known congener by (1) lacking a pair of prominent, globular lateral lobes at the anterior portion of the head, (2) having a pair of antennules with much enlarged basal portion, (3) bearing a pair of clavate antennae with obtuse terminal end and without lateral corrugations, (4) possession of a labrum with serrated posterior margin, and (5) having a distinctly small terminal hook (third segment) on the maxilliped.

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